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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/367,483	10/18/1999	TAKEO INAGAKI	IDE61601	4400

21118 7590 02/27/2002
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EXAMINER

ZIMMER, MARC S

ART UNIT	PAPER NUMBER
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1712

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DATE MAILED: 02/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/367,483

Applicant(s)

INAGAKI ET AL.

Examiner

Marc S. Zimmer

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-16 is/are rejected.
- 7) ☒ Claim(s) 7, 11, 13 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Specification

To this point, the Examiner has deemed the Application to be un-examinable because of numerous problems that are apparently associated with the translation of the foreign priority document(s) into the English language. One particularly confusing aspect of the instant invention was the recitation of a crosslinking step "in a binding region where cross-linking density is low". The Applicants have attempted to delineate the meaning of this concept stating in their response that,

"The term 'binding region' is not a spatial area but refers to a chemical range or condition in which a chemical reaction progresses."

Accordingly, they continue by explaining that the phrase, "...where crosslink density is low" should be construed as meaning,

"...cross-link *is* [sic] a binding condition in which crosslink density becomes low".

Unfortunately, this does not at all clarify the intended meaning of the second aspect of the phrase in question. However, having attempted to place the Applicant's statements in proper context, it is presently believed that the phrase, "...to cross-link in a binding region where crosslinking density is low, thereby producing said low cross-linking density gel for closely adhering to optical fibers." in, for instance, claim 1 means that the silicone gel material is *cross-linked to an extent that a gel having a low degree of crosslinking* is produced for closely adhering to optical fibers. Assuming that this current interpretation is correct, the Specification and claims should be substantially modified to incorporate this language or other language that is consistent with this idea as the term, "binding region" remains terribly ambiguous and should be removed.

For example, in the last paragraph on page 7 of the Specification, the sentence that begins with "As a result of..." could be replaced with,

"As a result of the addition reaction that provides a gel having a low-crosslink density, free hydrogen atoms are advantageously absent since they are fully consumed during the reaction".

In a separate example of how the disclosure should be modified, it is surmised that the sentence beginning with, "On the other hand..." in the fourth paragraph of page 8 might be amended to,

"On the other hand, if the gel is crosslinked to a lesser degree than is recommended above, the portion of the vinyl-functionalized polysiloxane that remains unreacted has an increased degree of freedom."

It should be emphasized for the record that the above-proposed passages are merely suggestions as to how the disclosure could be changed to make it more comprehensible. Though the Applicant is not required to employ precisely the same language recommended herein, the disclosure must be amended in a manner commensurate with these suggestions to impart much-needed clarity to the Specification and claims.

The following objections have been raised by the Examiner in papers 5 and 8 but have not yet been addressed:

(i) Both the Specification (page 7) and the claims (claim 1) mention a compounding technique that is used to "adjust the refractive index" of the silicone gel such that it is generally equal to that of the optical fibers being connected. There is nothing in the Specification however that describes precisely what this step entails.

Typically, a compounding operation simply involves the blending together of several materials hence it is not clear how this manipulation would yield a change of the refractive index unless other materials were added to the silicone matrix. Insofar as there is no support for the incorporation of other materials, it cannot be ascertained how the Applicants achieve an adjustment in the refractive index. In what appears to be an alternative method for shifting the refractive index, the Applicants contemplate that said index may be changed in the primary silicone agent, i.e. the vinyl-functionalized polysiloxane, "in advance" in the final paragraph of page 8. Again, it is not clear how this is accomplished. In both of the prior art references that are discussed *vide infra*, it is reported that the refractive index of a silicone matrix may be controlled by controlling the number of aryl substituents on the polymer backbone. Is this the manner in which the Applicants had intended to manipulate the refractive index of the connecting silicone? If so, there is nothing in the Specification that supports this notion.

(ii) The meaning of the sentence that begins, "The cross-linked binding region of the low-crosslinking density gel is in the range of 30% to 10% ..." on page 8, paragraph 3, is not understood. The Examiner postulated in paper no. 5 that this sentence might be indicating that the reactive alkene groups number 10% to 30% (are in a ratio of 1:10 to 3:10) relative to the quantity of Si-H groups in the organohydrogenpolysiloxane. It is now appreciated, however, that this possibility is in direct conflict with the disclosure that no hydrogen groups remain after the crosslinking reaction at the top of page 8.

The Specification is further objected to because the Applicant has labeled the second step in the process outlined on page 5 a "synthesizing step" yet no reaction takes place during that step. Indeed, that sequence would be better described as a "combining step".

Claim Objections

Claim 7 is objected to because the second step is falsely labeled a "synthesizing step" when, in fact, no reaction occurs at that stage of the process.

In claim 13, there is an "equals" sign instead of a hyphen between the words "linking" and "agent".

Claim 11 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The only difference between claims 10 and 11 is that, in the former, the refractive index is said to be "generally identical" to that of the refractive index of an optical fiber whereas the latter stipulates that said index is "substantially equal". These descriptions appear to be redundant despite the ambiguity in the words generally and substantially.

The "cross-linking reaction" and the "addition reaction" of claim 15 are precisely the same thus everything following the word "heated" should be removed.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 and 3-16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In each of these claims, either a compounding- or adjusting step is performed on the silicone gel material for the purpose of modifying the refractive index of said gel but the disclosure does not adequately divulge what precisely is involved. Because the Specification does not provide specifics concerning the manner in which the gel is manipulated, it will be assumed for the purpose of evaluating the instant invention against the prior art that the compounding/adjusting steps merely refer to the selection of a siloxane polymer featuring the desired refractive properties.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 3-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The gel is characterized in each of the independent claims as being one having "a low cross-link density". Ikeno, U.S. Patent # 5,599,894 has indicated that silicone gels are, in general, those cured products for which the extent of crosslinking is low. It is, therefore, unclear whether the Applicants are un-necessarily specifying an inherent characteristic of a gel or if, instead, the gel

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that they employ has a lower degree of crosslinking than even a conventional gel. (In essence, the meaning of "low" is unclear.)

There is an antecedent basis problem in claim 5 because neither claim 4 nor claim 1 mentions a polyorganosiloxane having covalently bound hydrogen atoms.

As for claims 10 and 11, the words "generally" and "substantially" prompt questions regarding how far the refractive index of the silicone connector may depart from that of the cores of the optical cables before the amount of reflected light becomes too great.

As for claim 15, there is no mention of a syringe in claims 10 or 13 thus the claim suffers from a lack of antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-5, and 10-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Filas et al., U.S. Patent # 5,266,352 in view of Ikeno, U.S. Patent # 5,599,894. They teach a silicone polymer material that may be employed as an agent for "index-matching" optical components including a plurality of optical fibers. Like the Applicants, Filas emphasizes the importance of identifying such materials to implement at fiber interfaces so that reflection losses due to a difference in the refractive index at said interface may be avoided. In column 2, they reveal that appropriate silicone

materials may be prepared by crosslinking a vinyl-terminated dimethyldiphenylsiloxane with one of several hydrosilyl group-containing siloxysilanes in the presence of a platinum catalyst wherein the refractive index is controlled by varying the overall phenyl content (column 2, lines 38-63).

It is notable that, whereas claims 5 and 14 contemplate the utilization of a polyorganosiloxane having covalently bound hydrogen atoms as a crosslinking agent, Filas reports that "certain tri- or tetrafunctional silanes" are used in this capacity. Nonetheless, insofar as the siloxysilanes particularly named in column 2, lines 58-61 feature a plurality of Si-H and Si-O-Si linkages, they may also be aptly described as polyorganosiloxanes having covalently bound hydrogen atoms. Hence, the limitations of these claims are satisfied.

Claims 1, 3-5 and 10-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki, EP 195 355 A2. Suzuki also discloses that addition cross-linked elastic polysiloxane materials may be used to connect the ends of optical fibers. According to page 7, the word "elastic" is intended to encompass all degrees of crosslinking including where the compounds form a gel. As in the Filas reference, it is volunteered on page 3 that the refractive index may be controlled by varying the phenyl content within a given range.

Allowable Subject Matter

Claims 6-9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, first and second paragraphs, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Regarding claim 6, it

has been previously documented that dust and other contaminants may be problematic when gels are used as connecting materials for joining two optical fibers (see Cammons et al., U.S. Patent # 5,082,345. Nonetheless, operations that are performed in a clean room are not advantageous due to the expense of maintaining a clean environment. Further, Szentesi et al., U.S. Patent # 5,748,819, point out that prefabrication of connected optical fibers is not always satisfactory because different design variations require customized installations that are not identified until the fibers reach the site.

Stoy et al., U.S. Patent # 5,066,091 disclose a procedure and apparatus for precisely aligning optical fibers after which an index matching gel such as a phenyl-substituted silicone is introduced using a syringe equipped with a 22 gauge needle. However, no explanation was offered as to why they chose that approach for adding the matching gel.

Priority

Acknowledgment is made of applicant's claim for foreign priority based on applications filed in Japan on December 12, 1997 and April 28, 1998. It is noted, however, that applicant has not filed certified copies of the Japanese applications as required by 35 U.S.C. 119(b).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc S. Zimmer whose telephone number is 703-605-1176. The examiner can normally be reached on Monday-Friday 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Dawson can be reached on 703-308-2340. The fax phone numbers

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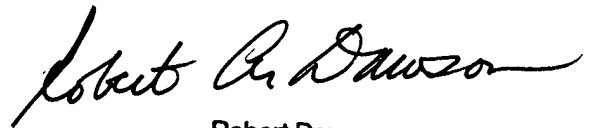
for the organization where this application or proceeding is assigned are 703-872-9310

for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Marc S. Zimmer
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February 18, 2002

A handwritten signature in black ink, reading "Robert Dawson". The signature is fluid and cursive, with a long horizontal stroke at the end.

Robert Dawson
Supervisory Patent Examiner
Technology Center 1700